

**What is claimed is:**

1. A test handler for transferring more than one semiconductor device to connect to a test head for testing the semiconductor device and for classifying the semiconductor device according to the test results, the test handler comprising:

a main body;

a stocker, disposed within the main body, including a user tray supplier for loading a plurality of user trays including a predetermined amount of the semiconductor devices for the testing, and a user tray deliver for loading the plurality of user trays carrying the classified semiconductor device according to the test results;

a plurality of test trays arranged according to a moving direction for testing the semiconductor device;

a device loading means for transferring the semiconductor device in the user tray of the user tray supplier to the test tray;

a first tray inverter changing a horizontal posture of the test tray carrying the semiconductor device to a vertical direction;

a soak chamber preparing a desired test temperature condition while receiving sequentially the test tray postured vertically by the first tray inverter and transferring the test tray to predetermined steps, and discharging the test trays arranged in two vertical rows;

a test chamber accomplishing tests while connecting the semiconductor devices in the two test trays discharged from the soak chamber, and maintaining the test temperature condition;

a de-soak chamber restoring the devices temperature while arranging the test trays discharged in two rows from the test chamber to a single row;

a second tray inverter inverting the test tray discharged in the vertical posture from the de-soak chamber to a horizontal posture; and

a device unloading means transferring the semiconductor devices on the test tray postured horizontally by the second tray inverter to multiple empty user trays after classifying the semiconductor devices according to the test results.

2. The test handler according to claim 1, wherein the stocker comprises a multi loader for classifying and storing the plurality of user trays.

3. The test handler according to claim 2, wherein the multi loader comprises:

a motor;

a ball screw rotated by the motor; and

a plurality of loader blocks lifting up and down by the ball screw and loading the classified user trays.

4. The test handler according to claim 3, wherein the multi loader comprises:

a discharge cylinder discharging the loader blocks to the outside of the test handler;

and

a transfer guide guiding the discharge of the loader blocks to an outside of the test handler by driving of the discharge cylinder.

5. The test handler according to claim 1, wherein the stocker performs the supply and the deliver of the user tray during test operation, the stocker comprising:

an auxiliary supplier equipped in a bottom side of the user tray supplier and loading the user trays to the user tray supplier when the user tray supplier completes loading the user trays within the user tray supplier; and

an auxiliary deliver equipped in the bottom side of the user tray deliver and

transferring the user tray of the user tray deliver when the user tray is loaded to the user tray deliver.

6. The test handler according to claim 1, wherein the device loading means comprises:

several loading side set plates arranged in an upper side of the user tray supplier and including the user tray for loading the devices;

a transfer arm transferring sequentially the user tray from the user tray supplier to the loading side set plate, and

a loading orthogonal robot moving sequentially and repeatedly between the loading side set plate and the loading side tray arranging station placing the test tray, and transferring the semiconductor devices on the user tray to the test tray.

7. The test handler according to claim 6, wherein the device loading means further comprises:

a site decision pin, inserted into a fixing hole equipped movably to the test tray, for fixing the insert to the test tray; and

a site decision unit including the site decision pin comprising a guide wall, inner-tapered to guide the device to the insert.

8. The test handler according to claim 6, wherein the transfer arm comprises a first sensor and a second sensor installed in an upper side of the transfer arm, moves at a predetermined speed until the first sensor detects a position of the user tray, and moves slower than the predetermined speed for the second sensor to detect the user tray when the first sensor detects the position of the user tray.

9. The test handler according to claim 6, the loading orthogonal robot comprising:

a front row and a rear row equipping eight vacuum pads respectively to pick up sixteen devices in unit operation;

a hand adjusting an interval between each of the vacuum pads; and

a transfer means driving the hand.

10. The test handler according to claim 9, wherein the transfer means comprises:

a front and rear transfer shifting the front row and the rear row in a forward or backward direction to adjust an interval between the front row and the rear row; and

a left and right transfer lifting up and down the vacuum pads to adjust an interval of each of the vacuum pads respectively.

11. The test handler according to claim 10, wherein the left and right transfer comprises:

a cam plate including a long hole to fit with a horizontal distance that each of the vacuum pads moves respectively; and

a cam follower in each of the vacuum pads inserted into the long hole of the cam plate to adjust an interval of the vacuum pads, while the cam plate lifts up and down.

12. The test handler according to claim 1, wherein the soak chamber comprises:

a guide bar loading the test tray of two vertical rows, top and bottom; and

a pusher transferring the test tray of two vertical rows loaded in the guide bar to a test position or a discharge position selectively.

13. The test handler according to claim 1, wherein the test head is placed at an outside of the main body.

14. The test handler according to claim 13, wherein the test chamber comprises:

an air inlet receiving air from the outside of the test chamber;

a plurality of discharge holes discharging the received air from the air inlet to a side of the test chamber; and

a matching plate comprising multiple penetration holes, generated in the side of the test chamber including the discharge holes, for supplying the discharged air from the discharge holes to the devices of the test tray.

15. The test handler according to claim 1, wherein a linear guide is equipped in a bottom side of the de-soak chamber and a linear block is equipped in the main body so that the de-soak chamber can be extracted to an outside of the main body by combing with the linear guide.

16. The test handler according to claim 1, wherein the device unloading means comprises:

first and second condense robots transferring the devices on the test tray placed in an unloading side tray arranging station, after classifying the devices according to the test results;

at least three sorter tables for storing the devices transferred by the first and second condense robots, according to a unit amount and a decided class of the devices;

an unloading side orthogonal robot transferring the devices stored in the sorter tables to a predetermined position, according to the unit amount and the decided class of the devices;

a plurality of unloading side set plates, arranged in an upper side of the user tray deliver, including a plurality of empty user trays for receiving the devices transferred by the unloading side orthogonal robot; and

a transfer arm transferring the empty user trays to the user tray deliver when the

empty user trays placed in the unloading side set plate are filled with a predetermined amount of the devices.

17. The test handler according to claim 1, wherein the first tray and the second tray inverter comprise respectively:

- an inverting plate including an insert hole in a middle part for the test tray to be admitted;

- a lifting cylinder combined with an end of a side of the inverting plate;

- a bracket, protruded from a bottom side of the inverting plate, including a long hole;

and

- a front/rear cylinder including a supporting axis combined with the end side of the bracket to push the inverting plate to a forward direction.

18. The test handler according to claim 17, wherein the inside of the insert hole comprises:

- a locking pin locking the test tray inserted in the insert hole; and

- a locking cylinder operating the locking pin.

19. The test handler according to claim 1, wherein the device unloading means comprises:

- a sorting part for sorting the devices according to the test results; and

- an unloading part for unloading the sorted devices from the sorting part.